

Appendix D. Demand, Supply and Need for Outdoor Recreation Areas

The purpose of this Appendix is to document the process used in measuring demand, computing supply and determining the need for outdoor recreation areas and facilities in Virginia.

2006 Virginia Outdoors Survey

Every five years, in preparation for the development of a new *Virginia Outdoors Plan*, the Department of Conservation and Recreation (DCR) conducts an outdoor recreation demand survey. The 2006 *Virginia Outdoors Survey* was a cooperative project between the DCR and Virginia Commonwealth University. Its purpose is to measure public demand for outdoor recreation areas and facilities in Virginia each year. In addition to addressing standard questions pertaining to participation in different types of outdoor recreational activities, the survey also asked specific questions about each activity. These questions included how many household members participated and the frequency of participation, how much time it took to reach the site of the activity, whether they participated in Virginia or left the state, and if they usually used a public or private facility. There were more types of recreational activities measured in the 2006 survey than in the 2000 survey; the activity list was expanded in order to develop more data on the types of outdoor recreational activities and resources enjoyed by Virginians.

Survey design and development

The 2006 survey was designed to elicit detailed information regarding major resource-based recreational activities. For example, camping questions sought to determine the type of camp equipment used, whether hookups were preferred, and what other amenities are preferred in a campground. Questions were also asked about the types of facilities and programs that should be provided within Virginia's state parks. Other questions probed for reasons for not using the state park system. Certain questions were designed to gain information about the types of outdoor recreational areas/facilities most in demand and to determine the public's attitudes toward the protection of open space. A summary of the survey, with the questionnaire, can be obtained by contacting the Department of Conservation and Recreation, Division of Planning and Recreation Resources, 203 Governor Street, Suite 326, Richmond, VA 23219.

Survey process

Because of the amount of information covered, the 2006 *Virginia Outdoors Survey* was a mailed questionnaire. To ensure accuracy of results at both the state and regional level, Virginia was divided into four regions for sampling purposes: the Chesapeake region (Planning Districts 17, 18 and 22), the urban corridor (Planning Districts 8, 15, 16, 19 and 23), the Piedmont region (Planning Districts 9 through 14), and the Mountain region (Planning Districts 1 through 7).

Addresses were acquired within each region through a random selection process and questionnaires were mailed. If a household failed to return its questionnaire within two weeks, a postcard reminder was sent. Households not responding within a given time were sent reminder letters, as well as additional survey copies. As a result of these efforts, more than 3,400 valid responses were received.

To help ensure validity of the data, responses were weighted according to 2000 Census data to correspond with population characteristics such as race, income, education, sex, and property ownership for each region. Survey estimates are 95 percent certain to be within a ± 2.0 percent confidence interval of the actual attitudes of the population at the statewide level. This high level of confidence makes the data an excellent source of information regarding Virginians' preferences and attitudes about outdoor recreation and open space resources. Results and trends from the survey are summarized in Chapter II.

Virginia recreation areas and facilities inventory

The Department of Conservation and Recreation maintains an inventory of all recreation areas and facilities in the state. This inventory is maintained by locality and is further subdivided by management agency, organization, or whether it is a public or private entity. Each recreation site, its name, acreage, and attributes are listed and enumerated. This inventory is sent every five years to each locality in the state for their corrections, deletions, and additions. Furthermore, data is updated for all federal and state land managing agencies that have holdings in Virginia.

Computing the need for outdoor recreation areas and facilities

The 2006 Virginia Outdoor Survey results are used to determine the units of recreation facility demand by activity. The Recreation Areas and Facilities Inventory provides us with our current units of supply for each activity. Subtracting "units of demand" from "units of supply" shows "units of need." In cases where supply exceeds demand, a surplus is shown. In many cases this surplus exists only when compared to local demand. When imported demand is added to local demand, many of these surpluses disappear.

To use the 2006 Virginia Outdoor Survey results in our computations, we first convert the findings to activity days.

Activity days are computed by multiplying the percent of the population participating in an activity by the median number of days spent by each participant within the survey region. It should be noted that the median figure results in a conservative estimate of the total number of activity days for each activity.

Table A-4 Capacity of Areas and Facilities by Activities

Activity	Weeks in Seasons	Peak Day Proportion	Instant Capacity	Turnover Factor	Daily Capacity	Units
Baseball	26	0.37	18	4	72	fields
Basketball	26	0.37	10	6	60	goals
Bicycling for pleasure	26	0.37	40	5	200	miles
Camping	26	0.46	3	1	3	sites
Canoeing, Kayaking, Jon Boating	36	0.44	8	6	48	stream miles
Fishing Stream	40	0.45	4	4	16	stream miles
Fishing Lake, Bay	40	0.45	0.5	4	2	water acres
Football	20	0.37	22	6	88	fields
Golf	26	0.39	72	2.5	180	courses
Hiking, Backpacking	26	0.40	10	3	30	trail miles
Horseback Riding	26	0.45	8	5	40	miles
Hunting	18	0.49	0.084	2	0.166	acres
Ice Skating	6	0.42	100	3	300	rinks
Jet Skiing	20	0.47	0.5	3	1.5	water acres
Jogging, Fitness Trail	26	0.15	24	3	72	mile trail
Motorcycling Off-Road	26	0.38	4	8	32	trail miles
Nature Study	26	0.37	2	2	4	acres
Picnicking Away From Home	26	0.54	4	2	8	tables
Pools, Swimming Outdoors	14	0.40	225	3	675	pools
Pools, Swimming Indoors	52	0.40	225	3	675	pools
Power Boating	26	0.47	0.25	3	0.75	water acres
Playground Use	26	0.37	25	4	100	sites
Rafting	26	0.44	16	6	96	stream miles
Sailboarding	26	0.45	1	2	2	water acres
Sailing	26	0.45	0.5	2	1	water acres
Skateboarding	26	0.40	25	2	50	sites
Snow Skiing	14	0.27	75	10	750	ski lifts
Soccer	20	0.37	22	6	88	fields
Softball	26	0.37	20	4	80	fields
Sunbathing, Beach Use	20	0.43	150	2	300	beach acres
Swimming, Outdoor Area	14	0.43	150	2	300	beach acres
Tennis	26	0.39	4	6	24	courts
Tubing	14	0.44	40	6	240	stream miles
Unlicensed All-Terrain Vehicle Use	26	0.38	4	8	32	trail miles
Visiting Gardens	40	0.44	50	2	100	sites
Visiting Historic Sites	52	0.44	50	2	100	sites
Visiting Natural Areas	26	0.44	50	2	100	sites
Volleyball	26	0.37	12	6	48	courts
Water Skiing	20	0.47	0.25	3	0.75	water acres

Appendix D. Demand, Supply and Need for Outdoor Recreation Areas

To convert activity days into units of demand, capacity standards multipliers on Table A-4: Capacity of Areas and Facilities by Activities are used. Activity clusters were developed for some activities, such as water-based recreation, which share the same resources. Current needs based on 2000 Census figures were projected to the year 2020 using official population projections, by locality, obtained from the Virginia Employment Commission.

The geographic level of analysis for estimating demand was the survey region. Statewide needs were obtained by adding regional needs. Planning district demand and local demand were allocated proportionally to the population of each sub-area within each region. Computations for demand are based on the findings for the specific sampling region. For example, demand in the New River Valley is computed using the findings for the Mountain region. Likewise, those for the Richmond area are based on the findings from the Urban Crescent region.

The formula for computing demand is as follows:

$$D = (A/W)P/C$$

Where:

- D** is the demand in units,
- A** is the annual number of activity days spent in the activity,
- W** is the number of weeks the activity is in season,
- P** is the proportion of activity days that occur on the peak day of the week, and
- C** is the daily capacity of the facility or area unit.

The daily capacity, C, is calculated as:

$$C = IT$$

Where:

- I** is the instant capacity, and
- T** is the turnover factor per day.

In estimating area and facility demand, activity clusters were identified. Stream fishing, canoeing, kayaking and jon boating, rafting and tubing all use stream miles. Therefore, demand for these activities was added together to compare with the inventory total for this resource. Lake and bay fishing, sailing, sailboarding, power boating, water skiing and jet skiing were combined to obtain a total need for water acres. Off-road motorcycling and unlicensed all-terrain vehicle use were combined for off-road trail miles. The demand for outdoor swimming at natural areas was estimated in terms of beach acres rather than water acres, and this was combined with sunbathing. Football and soccer demand were added together because they share the same fields.

Alternate estimates of demand can be calculated from the results for two activities using the following conversion factors: large indoor or outdoor swimming pools can accommodate three times the number of users as standard size pools, and demand for ski areas may be estimated as 44 acres per lift, or one acre per 17 skiers per day.

Regional findings of the demand, supply, and needs analysis

A table summarizing the findings of the 2006 *Virginia Outdoors Survey* data for each region is presented at the end of each regional analysis in Chapter X. Table A-5 projects facility needs for 2010 and 2020.

Summarizing results from the 2006 *Virginia Outdoors Survey*

The available supply of recreational areas and facilities forms the link between recreational demand and the need for outdoor recreational opportunities. An updated and current inventory of the outdoor recreational supply is an essential factor for measuring actual needs in the commonwealth.

In 2005, the Department of Conservation and Recreation conducted a statewide inventory of existing outdoor areas and facilities throughout Virginia. This survey was designed to solicit information from all cities, towns, counties, and local parks and recreation agencies. Respondents were provided with an inventory of local recreational sites and facilities and were asked to make additions and/or deletions to existing sites. Respondents were furnished with a form on which to tabulate and record recreation resources not currently listed in the state's supply system. To determine the true supply and subsequent need for outdoor recreational areas and facilities, it was requested that information on all recreational providers — public, quasi-public, and private, be included.

DCR stores and maintains computerized inventory records on the statewide supply of outdoor recreational areas and facilities. The supply data is arranged and stored by locality, recreational region and planning district commission. The availability and use of sites and facilities is categorized as public, quasi-public, or private, and site ownership is identified as local, regional, state or federal. Land and water acreage is indicated, as is specific information on the type and number of facilities. The data system allows DCR to periodically update and add new information into the supply inventory.

The inventory has been expanded to include many private tennis areas, swimming and racquet clubs, hunting clubs and recreational facilities located in housing developments. DCR has the capacity to store more information about private recreational areas and facilities. This feature improves knowledge of available supply and more accurately validates information about outdoor recreational demand and need. Such information about locally available public and private recreational facilities also ensures that real needs are not duplicated in the planning process. Every effort is made to obtain accurate information from survey respondents. However, some large resource areas and facilities serve multiple areas, which can lead to overlapping survey information. It is requested that any discrepancies found in this document be reported to DCR's Division of Planning and Recreation Resources at 804-786-6140.

Table A-5 Projected Statewide Needs

Activity	Activity Days	Demand	Units	Total Supply	Private Supply	2000 Needs	2010 Demand	2010 Needs
Baseball	12,466,080	2,464	fields	1,828	158	2,082	2,695	2,313
Basketball	31,234,301	7,408	goals	3,027	199	4,381	8,135	5,108
Bicycling	67,133,477	4,777	miles	NI	5,247			
Lake, River, Bay Use (combined)	38,736,080	507,854	water acres	1,302,491	-794,637	553,502	-748,989	
Power Boating	11,199,042	269,926	water acres	S	294,328			
Sailing	2,253,110	19,498	water acres	S	20,975			
Lake Fishing	12,240,857	68,855	water acres	S	74,494			
Salt Water Fishing	8,536,764	48,019	water acres	S	52,833			
Jet Ski, Personal Watercraft	2,530,308	39,641	water acres	S	43,309			
Water-Skiing, Towed on Water	1,975,998	61,915	water acres	S	67,562			
Camping (*)	12,775,279	75,341	sites	51,257		24,084	82,188	30,931
Tent camping	4,187,630	24,696	sites	8,942	5066	15,754	27,025	18,083
Developed camping	8,587,649	50,645	sites	42,315	35453	8,330	55,163	12,848
Fitness Trail use	4,852,462	389	mile trails	422	47	-33	430	8
Fields (combined)	38,644,615	8,124	fields	2,185	84	5,939	8,953	6,768
Football	21,158,134	4,448	fields	NS	4,907			
Soccer	17,486,481	3,676	fields	NS	4,047			
Stream Use (combined)	15,743,642	9,006	stream miles	3,175		5,831	9,753	6,578
Stream Fishing	11,481,493	8,073	stream miles	S	8,736			
Human-powered boating	2,827,129	720	stream miles	S	784			
Rafting	568,456	100	stream miles	S	109			
Tubing	866,564	113	stream miles	S	124			
Golfing	22,665,370	765	courses	301	361	464	837	536
Hiking, Backpacking	8,909,287	4,569	trail miles	5,363	612	-794	4,967	-396
Horseback Riding	1,833,529	793	miles	2,103	472	-1,310	861	-1,242
In-Line Skating	14,219,037	1,012	miles	NI	1,119			
Jogging, Running	88,143,668	7,063	mile trails	NI	7,776			

NA: not applicable, no standard needed

S: same as combined

NS: not inventoried separately

NI: not inventoried
20.4 % of 2000 Virginia Outdoor Survey respondents preferred primitive campsites

(-) indicates surplus

Note: Demand multipliers used to create this chart are based on the findings of the *Virginia Outdoors Survey* as measured at the regional level. In regions with significant contrasts in population density and demographics, need results may show surpluses where none exist, especially in sparsely populated counties. Additional analysis will be required to adjust these results to local conditions.

Table A-5 Projected Statewide Needs – continued

Activity	Activity Days	Demand	Units	Total Supply	Private Supply	2000 Needs	2010 Demand	2010 Needs
Nature Study, Programs	3,130,303	445	sites	67	378	489	422	
Picnicking Away from Home	9,682,208	25,137	tables	33,035	10,517	-7,898	27,462	-5,573
Skateboarding	4,897,560	1,507	sites	NI	1,665			
Snow-Skiing or Snowboarding	3,090,031	79	ski lifts	22	22	57	87	65
Softball	14,523,040	2,583	fields	1,871	121	712	2,833	962
Sunbathing, Relaxing on Beach	25,564,746	1,832	beach acres	2,047	435	-215	2,013	-34
Swimming, Outdoor Area	19,014,841	1,947	beach acres	2,047	-100	2,141	94	
Swimming, Outdoor pools	22,355,220	946	pools	747	507	199	1,039	292
Swimming, Indoor pools	13,477,237	154	pools	64	20	90	169	105
Tennis	13,009,606	8,131	courts	3,914	1,501	4,217	8,944	5,030
Used a Playground	38,084,653	5,420	sites	2,666	276	2,754	5,962	3,296
Visiting Gardens	3,048,908	335	sites	NI	369			
Visiting Historic Sites	13,141,685	1,112	sites	NI	1,223			
Visiting Natural Areas	7,799,637	1,320	sites	NI	1,444			
Volleyball	3,090,000	916	courts	144	17	772	1,002	858
Went Hunting	10,232,450	1,678,012	acres	2,142,241	-464,229	1,815,697	-326,544	
Went Shooting Total	6,005,147	3,392	fields	NI	3,665			
Target	4,041,035	2,283	fields	NI	2,484			
Skeet or Trap	1,574,402	889	fields	39	850	965	926	
Other	838,768	474	fields	NI	513			
Drive for Pleasure	54,482,683	NA	NA	NI	NA			
Motorcycle, ATV (combined)	4,908,532	2,242	miles	228	5	2,014	2,415	2,187
Driving All-Terrain Vehicle	3,577,252	1,634	miles	NS	1,759			
Driving Motorcycle Off-Road	1,331,281	608	miles	NS	656			
Driving 4-Wheel-Drive Off-Road	3,565,865	NA	NA	NI	NA			
Walking for Pleasure	224,976,112	NA	NA	NI	NA			
Other	3,537,520	NA	NA	NI	NA			

NA: not applicable, no standard needed

S: same as combined

NS: not inventoried separately

NI: not inventoried

(-) indicates surplus

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Table A-6. Statewide Supply of Recreational Facilities

Activity	Supply	Activity	Supply
Baseball	1,803 fields	In-Line Skating	NI miles ***
Basketball	2,936 goals	Jogging/Running	NI mile trails**
Bicycling	NI miles ***	Nature Study/ Programs	71 sites
Bicycling – Mountain	NI miles	Picnicking Away from Home	32,439 tables
Bicycling Other	NI miles	Skateboarding	NI sites
Lake, River and Bay Use (combined)	1,302,736 water acres	Snow Skiing or Snowboarding	17 ski lifts
Power Boating	S water acres	Softball	1,821 fields
Sailing	S water acres	Sunbathing, Relaxing on Beach	2,837 beach acres
Salt Water Fishing	S water acres	Swimming	NI
Jet Ski/ Personal Watercraft	S water acres	Swimming Outdoor Area	2,837 beach acres
Water Skiing/Towed on Water	S water acres	Swimming Outdoor pools	727 pools
Camping	50,954 sites	Swimming Indoor pools	63 pools
Tent camping	8,917 sites	Tennis	3,793 courts
Developed camping	42,037 sites	Used a Playground	2,681 sites
Fitness Trail use	417 mile trails	Visiting Gardens	NI sites
Fields (combined)	2,182 fields	Visiting Historic Sites	NI sites
Football	2,149 fields	Visiting Natural Areas	NI sites
Soccer	33 fields	Volleyball	148 courts
Stream Use (combined)	3,057 stream miles	Went Hunting	1,999,631 acres
Fresh Water Fishing	S stream miles	Drive for Pleasure	NI na ***
Human-powered boating	S stream miles	Driving Motorcycle Off Road	218 miles
Rafting	S stream miles	Driving 4-Wheel-Drive Off Road	NI na ****
Tubing	S stream miles	Walking for Pleasure	NI na ***
Golfing	5,399 courses	Bird Watching	NI na
Hiking/ Backpacking	5,218 trail miles	Other	NI na
Horseback Riding	2,057 miles		
NI Not Inventoried <i>* Not added to other similar resources</i> <i>*** Unmeasured, provided on any suitable surface including local streets</i> <i>** Includes only specially constructed trails</i> <i>**** Unmeasured, provided on any suitable surface</i>			

The supply inventory does not measure the quality of available facilities (see Table A-6). However, information on maintenance capability, facility design, lighting, accessibility and other environmental factors usually indicates if the supply of recreational resources has maximum user potential.

The Department of Conservation and Recreation uses information gathered on the existing supply of outdoor recreational areas and facilities as a resource for several in-house initiatives related to planning, grants administration and technical assistance for parks and recreation. DCR also distributes this information to federal agencies and to local and regional political jurisdictions in the Commonwealth.

In order to accurately assess and meet the recreation and open space needs of a locality, it is imperative to consider the following variable during the planning process. When assessing existing and proposed recreational development, consider that even though a region, county or city may show

a surplus of resources (e.g., soccer/football fields, boat ramps, trails, local parks) based on the locality's inventory of recreation resources, not all opportunities are available to all citizens. Barriers like proximity (travel distance) and access (private, member-only facilities) must be taken into consideration to accurately meet needs of the locality.

In 2000, the National Survey on Recreation and the Environment interviewed approximately 5,000 Americans, ages 16 and older, about their participation in twelve categories of outdoor recreation. This survey was also conducted in 1982-83 and in 1994-95. Table A-7 shows a comparison of participation rates by Americans in outdoor recreation activities from 1994-95 to 2000 and the percent of change in participation rates. The findings in this survey show participation rates in many activities increasing dramatically, while the Virginia Outdoor Survey found less dramatic increases in some activities and many activities with declining participation rates.

Appendix D. Demand, Supply and Need for Outdoor Recreation Areas

Table A-7. National Survey on Recreation and the Environment (NSRE)

Activity	Number in 1994-95 (Millions)	Number in 2000 (Millions)	Percent Change
Bicycling	57.4	84.8	+47.7
Horseback riding	14.3	23.6	+65.0
Outdoor team sports	53.0	43.5	-17.9
Boating	58.1	90.9	+56.4
Sailing	9.6	12.4	+29.1
Motor boating	47.0	58.9	+25.3
Water skiing	17.9	18.9	+5.5
Swimming/non-pool	78.1	102.2	+30.8
Fishing	57.8	75.7	+30.9
Hunting	18.6	21.1	+13.4
Hiking	47.8	73.8	+54.3
Walking	133.7	180.6	+35.1
Bird watching	54.1	84.9	+56.9
Picnicking	98.3	124.2	+26.3
Sightseeing	113.4	124.8	+10.0
Off-road driving	27.9	40.2	+44.0
Downhill skiing	16.8	19.7	+17.2
Cross-country skiing	6.5	10.6	+63.1
Snowmobiling	7.1	12.6	+77.4
Camping, Developed area	41.5	56.8	+36.8
Camping, Primitive area	28.0	35.4	+26.4
Backpacking	15.2	24.9	+63.8